WHAT IS CLAIMED IS:

1. An orbital sander comprising:

an elongate tubular housing aligned along the central axis having a first end, a central tubular region in the second end;

a high speed permanent magnet DC motor disposed within the housing central tubular region, the motor having a cylindrical body and a rotary motor shaft generally coaxially aligned with the central axis;

an eccentric drive shaft rotatably driven by the motor shaft about the central axis and having a drive member eccentrically offset from the central axis;

a sanding platen oriented adjacent to the housing second end and orbitally driven by the drive member, the platen having a planar surface perpendicular to the central axis adapted to receive sand paper; and

a bearing interposed between the sanding platen and the eccentric drive shaft drive member freely rotatably connecting the sanding platen and drive member to cause the sanding platen to orbit as the motor rotates.

2. The orbital sander of claim 1 wherein the motor speed drops less than 10% when the motor load is increased from the no load condition to the maximum continuous operation rated load.

3. The orbital sander of claim 1 wherein the motor speed drops less than 15% when the motor load is increased from the no load condition to the maximum continuous operation rated load.

4. The orbital sander of claim 1 wherein the motor speed drops less than 25% when the motor load is increased from the no load condition to the maximum continuous operation rated load.

5. The orbital sander of claim 4 wherein the motor speed at the maximum continuous operation rated load is in excess of 10,000 rpm.

6. The orbital sander of claim 4 wherein the motor speed at the maximum continuous operation rated load is in excess of 11,000 rpm.

7. The orbital sander of claim 1 wherein the motor has a speed in excess of 8,000 rpm when the motor is loaded at a torque of 20 in. oz.

8. The orbital sander of claim 1 wherein the motor has a speed in excess of 10,000 rpm when the motor is loaded at a torque of 15 in. oz.

9. The orbital sander of claim 1 wherein the motor has a speed in excess of 12,000 rpm when the motor is loaded at a torque of 10 in. oz.

10. The orbital sander of claim 1 wherein the motor speed drops less than 10% when the motor load is increased from 50% of the maximum continuous operation rated load to 100% of the maximum continuous operation rated load.

11. The orbital sander of claim 1 wherein the sanding platen is freely mounted to the housing by the bearing and is capable of rotating about the extension axis in order to operate in a random orbit manner.

12. The orbital sander of claim 1 wherein the sanding platen is mounted to the housing by a retainer which allows relative orbital movement of the sanding platen relative to the housing, but prohibits free rotation of the sanding platen about the outer axis.

13. The orbital sander of claim 12 wherein the retainer further comprises an elastic element cooperating with the housing and the sanding platen.

14. The orbital sander of claim 1 wherein the eccentric drive further comprises a fan having a disc extending about and lying in a plane perpendicular to the motor axis and a plurality of generally uniformly shaped blades

circumaxially spaced about the disc in a non-uniform manner in order to balance the eccentric drive and sanding platen sub-assembly about the motor axis.

15. The orbital sander of claim 14 wherein the blades are generally uniform in thickness and that the non-uniform distribution of the blades results in balancing the eccentric drive sanding platen assembly without the use of balanced weight.

16. The orbital sander of claim 1 wherein the disc portion of the fan is generally uniform in thickness and each of the plurality of fan blades are generally uniform in thickness enabling the eccentric drive to be integrally formed as a metal die casting minimum porosity.

17. The orbital sander of claim 16 wherein the fan portion of the eccentric drive is not individually balanced post cast.

18. The orbital sander of claim 15 wherein the blades are of the radial tip configuration.

19. The orbital sander of claim 1 further comprising a power supply oriented within the housing, the power supply having an input adaptable to be coupled to a source of AC power and DC output electrically connected to the motor.

20. The orbital sander of claim 19 wherein the power supply further includes an on/off switch and the random orbit sander further comprises a switch actuation bar which extends through the housing first end and is shiftable along an axis lying in a plane perpendicular to the motor axis, the switch actuation bar having two opposed ends at least one of which is extending from the housing at all times enabling the operator to turn the motor on and off by alternatively pushing opposed ends of the switch actuation bar which in turn varies the state of the electrical switch mounted internally within the housing.

21. The orbital sander of claim 1 wherein the housing defines an annular dust collection in a chamber circumaxially extending about the eccentric drive and terminating in a dust outlet, the sanding platen is provided with a plurality of dust collection ports extending therethrough and the eccentric drive is provided with a fan so the rotation of the motor causes the fan to rotate drawing air and dust through the ports in the sanding platen and discharging the air and dust through the dust outlet.

22. The orbital sander of claim 21 wherein the dust outlet is formed by a relatively small diameter outlet tube having a relatively larger diameter collar spaced thereabout the small diameter tube sized to cooperate with a small diameter dust collection tube and the larger diameter collar sized to alternatively cooperate with a large diameter or a porous dust collection cannister.

23. The orbital sander of claim 21 wherein the relatively small dust outlet tube is a nominal diameter to 1" to 1½ while the collar has a diameter of 2" to 2 3/4".